C-HOBIC – Standardized Information to Support Clinical Practice and Quality Patient Care across Canada

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Abstract

Canadian Health Outcomes for Better Information and Care (C-HOBIC) is leading the collection of standardized clinical outcomes reflective of nursing practice. C-HOBIC introduces a systematic structured language for patient assessments across the health care system enabling abstraction of information into jurisdictional EHRs Thus the information is available to clinicians across the health care system.

This paper provides the background to C-HOBIC with an overview of the evidence supporting the clinical outcomes; the methodology for the electronic collection and abstraction of outcomesincluding the implications of including nursing information on databases; and describesthe approach tocoding information for interoperability and comparability of clinical information across the health care system.

Introduction

Measuring and improving the quality of health care delivery is one of the critical challenges facing clinicians, researchers, decision-makers and policy makers. While many kinds of data are collected, the health care environment has a scarcity of the right types of information upon which to base decisions. Standardization of health outcome measures promotes consistency and allows information to be compared across practice settings, to be included in electronic health records (EHRs), and to be aggregated to support health system use.

In Canada, there has been significant investment in the information requirementsfor EHRs, but much of the focus and funding has been on information about physicians, diagnostics and laboratory results. So, despite the fact that nurses are the most numerous care providers in all sectors of the health care system, they are essentially invisible in most electronic records. It is important that information that is of value to nurses in planning care and evaluating care be included in EHRs. Furthermore, this information must be available to nurse leaders to support decision-making regarding health human resources and quality initiatives.

Background

The Canadian Nurses Association (CNA) is a federation of 11 provincial and territorial registered nurses associations representing more than 133,714 Canadian registered nurses across Canada[1]. CNA is the national professional voice of registered nurses, supporting them in their practice and advocating for healthy public policy and a high quality, publicly funded, not-for-profit health system[2]. In the fall of 2006 the Canadian Nurses Association partnered with the Ministriesof Health in three Canadian provincesto develop a proposal to Canada Health Infoway (Infoway) for funding to support the inclusion of standardized nursing information in EHRs.

Infowayis a federally-funded, independent, not-for-profit organization and is the Canadian catalyst for collaborative change to accelerate the use of electronic health information systems and electronic health records (EHRs) across the country. Infoway invests in a common, pan-Canadian framework of electronic health record systems where best practices and successful projects in one region can be shared or replicated in another province or jurisdiction[3]. In May of 2007 funding was announced to support the Canadian Health Outcomes for Better Information and Care (C-HOBIC) project. This was the first funded initiative in nursing for Infoway.

C-HOBIC introduces a systematic structured language for patient assessments across the health care system enabling this information to be abstracted into jurisdictional EHRs and available to clinicians across the health care system.

The goals of this project were to:

- Standardize assessment and documentation of patient-centered outcomes by nurses in participating provinces.
- Capture nurse-sensitive, patient-centered, clinical outcomes data across 4 sectors (acute care, complex continuing care, long-term care and home care) of the health system;
- Standardize the language concepts used by C-HOBIC to the standardized clinical reference terminology of nursing - International Classification for Nursing Practice (ICNP®);
- Store the captured and standardized data in relevant secure jurisdictional data repositories/databases in preparation for entry into provincial EHRs;
- Foster EHR uptake by nurses in participating provinces by providing content in the EHR that is of use in nursing practice.

C-HOBIC builds and expands on work that was conducted in the province of Ontario as part of the Nursing and Health Outcomes Project now known as Health Outcomes for Better Information and Care Program.This program, funded by the Ontario Ministry of Health and Long-Term Care, was developed to fill a critical information gap and make the contribution of nurses visible through the province-wide, standardized collection of evidence based, nursing sensitive outcomes. The HOBIC program works with acute care, complex continuing care, long-term care and home care settings across the province of Ontario to support them in the collection of standardized nursing-sensitive clinical outcomes and the abstraction of this information to a provincial database that allows for real time reporting back to organizations[4]. As part of this program, in settings where nursing-sensitive patient outcomes were already being collected, the HOBIC Program used existing tools or measures to reduce the burden of data collection[5]. The HOBIC program captured outcome data utilizing a variety oftools, including the International Resident Assessment (interRAI) tools, the Therapeutic Self Care (TSC) scale developed by Sidani& Doran, and a nausea scale unique to HOBIC (see Table 1).interRAI are a series of assessments common measures that enables clinicians and providers in different care settings to use standardized language to assess clients with the goal of improving continuity of care, as well as integrating care across the continuum[6]

Table 1

Concept	Acute Care	Long-term Care	Home Care
Functional status	interRAI	interRAI	interRAI
Continence	interRAI	interRAI	interRAI
Therapeutic self-care	Doran &Sidani tool	N/A	Doran &Sidani tool
Pain – Frequency	interRAI	interRAI	interRAI
Pain – Intensity	0-10 numeric	interRAI	interRAI
Fatigue	interRAI	interRAI	interRAI
Dyspena	interRAI	interRAI	interRAI
Nausea	MOH scale	MOH scale	MOH scale
Falls	interRAI	interRAI	interRAI
Pressure ulcers	interRAI	interRAI	interRAI

C-HOBIC Phase 1

Phase 1 began in May 2007 and was successfully completed December 2009. C-HOBIC introduced the electronic collection of the following evidence based nursing-sensitive patient-centered outcomes:

- functional status,
- therapeutic self care (readiness for discharge),
- symptom management (pain, nausea, fatigue, dyspnea),
- safety outcomes (falls, pressure ulcers).

Nursing sensitive outcomes were defined as those that are relevant to nursing based on nurses' domain and scope of practice, and for which there is empirical evidence linking nursing inputs and/or interventions[7]. These clinical outcomes represent information that nurses already collect. C-HOBIC merely provides nurses with a standardized way of recording what they do and therefore supports the abstraction to provincial/jurisdictional databases. The C-HOBIC Phase 1 implementation supported the collection of these measures beyond the province of Ontario. In the province of Saskatchewan, this involved introducing the collection of a subset of these measures in 30 long-term care homes. In Manitoba, the implementation occurred in six long-term care homes, for a total of 1,005 long-term care beds, and in six home care offices, with approximately 3,300 clients in home care in the Winnipeg Regional Health Authority. Previously, this information was entered into a database and submitted to the Canadian Institute for Health Information, but the information is not provided back to clinicians; through C-HOBIC, information is now available and accessible to clinicians to use for care planning and evaluation of care outcomes. As part of this project, education was provided to nurses on using standardized clinical outcomes to use, plan for and evaluate care.

A key component of any Infoway funded project is evaluation, as they recognize that end user acceptance and adoption of electronic health information systems is critical to the success of an EHR. As end users, nurses will need tochange their behavior in response to an increasingly complex health care environment that includes EHRs. As EHRs become more prominent in the health care arena, more information will be available to clinicians about the patients to whom they provide care. Importantly, inclusion of information that is of value to nurses in the electronic health record will influence nursing uptake of the information and the electronic health record in general.

The C-HOBIC Phase 1 evaluation focused on:

- Examining the value of C-HOBIC information to nurses in planning for and evaluating patient care;
- Exploring how C-HOBIC information is integrated into the work flow of nurses' daily activities;
- Considering how the aggregated information is used by managers and policy makers;
- Identifying the parameters that need to be implemented within four types of settings (acute care, complex continuing care, long-term care and home care) to ensure conditions for success and nursing uptake of technology.

Data collection occurred via a web-basedsurvey, focus group sessions, and key stakeholder interviews. Difficulties in data collection were encountered due to insufficient infrastructure, such as lack of internet access at nursing stations to use the electronic survey tool. One of the key findings from this evaluation is that clinicians require time and resources to adopt information intensive initiatives such as C-HOBIC and successfully incorporate them into their clinical practices[8]. Evaluation findings were most positive in care sectors which had been both involved in the initiative the longest and which have focused resources on assisting clinicians to use the C-HOBIC information to improve their practice. User feedback illustrated that, while adoption is not complete, clinicians see the incorporation of C-HOBIC data and reports as beneficial.

The successful completion of Phase 1of the C-HOBIC Project marked the first time in Canada that standardized clinical information reflective of nursing practice was being collected and made available to clinicians.

Mapping to ICNP® and SNOMEDCT

The International Classification for Nursing Practice® is the terminology endorsed by the CNA for documenting professional nursing practice in Canada[9]. Using ICNP® Version 1.0 as the coding structure for this project, the CNA and its partners, for the first time in Canadian healthcare history, were able to utilize a standardized nursing documentation method for capturing, analyzing and reporting nursing sensitive outcomes for inclusion in the pan-Canadian health record.

As part of the C-HOBIC Phase 1 project, a consultant was recruited to map the C-HOBIC concepts to ICNP®. This work addressed gaps in health information related to nursing's contribution to patient care and also addressed the need for standardized nursing data for inclusion on patient admission and discharge summaries. Canadian nurses from academic settings, government ministries, policy institutions and practice environments, as well as two international ICNP® experts, were invited to review and provide feedback on the mapping, the unique C-HOBIC

terms, and ICNP® term equivalencies or potential new terms. The outcome was a catalogue -Mapping Canadian Outcomes in ICNP that was posted on the C-HOBIC webpage so that it was available to nurses and infomaticians across Canada[10]. Subsequently the C-HOBIC team mapped the concepts to ICNP® Version 2 resulting in theNursing Outcome Indicators Catalogue[11].

At the time of the original proposal to Infoway, the C-HOBIC team was directed by Infoway to map the C-HOBIC concepts to ICNP®, as the clinical terminology standard for the EHR in Canada was not yet determined. Subsequently, the Strategic Committee of the Infoway Standards Collaborative made the decision to recommend SNOMEDCT as the clinical terminology for use in EHRs in Canada. In 2009, the International Health Terminologies Standards Development Organization (IHTSDO) (the holders of the intellectual property of SNOMED-CT) and the International Council of Nurses entered into a Harmonization Agreement to review and design cross-referencing and mapping opportunities. This memorandum of understanding provided an opportunity for the C-HOBC team to extend the work completed in Phase1.Working in collaboration with ICN, the team mapped the C-HOBIC concepts to SNOMED-CT. Through this process, gaps related to clinical nursing practice were identified in SNOMED CT. This mapping will support the inclusion of the C-HOBIC suite of patient-centered clinical outcomes in Canadian EHRs to support clinicians in their practice. Because SNOMED CT is the clinical terminology recommended by Infowayfor use in EHR(s) in Canada, this will have a far-reaching impact on the uptake of these clinical outcomes across jurisdictions and care settings.

C-HOBIC Phase 2

This phase, currently underway, involves the extension of the collection of the C-HOBIC measures into acute care in the Winnipeg Health Region (WHR) and the development, implementation and evaluation of a new mechanism for using C-HOBIC data to facilitate patient transition from one sector of the health care delivery system to another, i.e. among acute care, long term care and home care.

Winnipeg Health Region is in the process of implementing a clinical information system in their acute care hospitals and will include the C-HOBIC concepts into the development of clinical documentation tools. With the progression into the acute care sector, the WHR will be positioned to make the C-HOBIC information accessible to clinicians in their electronic patient record (EPR). Such access will support patient care transition from one sector to another and allow for streamlining patient information flow making C-HOBIC information accessible for nurses, doctors and other health care providers to support the delivery of safe, quality care.

As part of C-HOBIC Phase 2, a synoptic report of transitional information is being developed. This will support and facilitate use of the electronically captured standardized clinical outcomes data by providing a meaningful format for transmission of C-HOBIC information between sectors of the health care system to support continuity of care.Synoptic reporting of transitional information will assist clinicians in communicating effectively with each other (e.g. to ensure safe hand-offs) to improve clinical practice and patient outcomes. Making this information available as patients transition from one sector to another will provide nurses with immediate and meaningful information that can support the critical decisions that are necessary by nurses in planning for and delivering patient care. Based on the 36 data elements in four categories of the C-HOBIC data set, the transition synoptic record will provide a summary of the patient's outcome status on transition from one clinical care sector to another. Such access will support patient care transition from one sector to another and allow for streamlining patient information flow making C-HOBIC information accessible for nurses, doctors and other health care providers to support the delivery of safe, quality care.

Benefits of Standardized Clinical Information Reflective of Nursing Practice

The major goal of measuring patient outcomes is to improve clinical practice, leading to improved patient outcomes. One of the challenges in the implementation of an electronic health record is the engagement of end users. For end users such as nurses to participate in and use an electronic health record, there needs to be a clear value proposition. In other words, there is a need for information that is of value to them in their practice to be included in the electronic health record. To date, nurses have not readily had access to information that allows them to track changes in patients as a result of the care that nurses provide. Through the provision of standardized information available in real time or near real time, EHRs offer the opportunity for clinicians to see how their practice is making a difference in care that is provided. C-HOBIC extends the functionality of the EHR beyond merely the communication of information to information that actually enables health care professionals to assess the impact of their practice on patient outcomes across the health care system[12]. Nurses support the value of using this information

to examine practice and support decision making regarding quality patient care. This type of information supports nurses' accountability in the delivery of patient care.

As EHRs are developed, it is vital that they include information that is important to patients/clients as they move through the healthcare system. Unfortunately, as health care organizations deploy clinical information systems the focus is on health information related to a specific organization or a specific sector and there is often a lack of consistent standardized clinical information. With an aging population and an increased focus on chronic disease,information that is patient-centred and standardized is essential to the management and delivery of health care. The C-HOBIC concepts represent information that is important to people within the health care system[13]. The suite of health outcomes is patient-centered and can be collected in a standardized way across the system.

Towards Pan-Canadian Standards for Nursing Data

CNA envisions the C-HOBIC standardized information eventually being collected in all provinces in Canada and included in the interoperable EHR. To support this agenda CNA has engaged nurse leaders from across Canada in examining and exploring the benefits of capturing standardized clinical information as they implement clinical information systems. Advancing this agenda nationally is not without challenges. There are many vendors in different sectors of the health care system in Canada. Furthermore, health care organizations are at different stages in the implementation of clinical information systems in Canada. Ideally, the best time to add the C-HOBIC questions to admission and discharge assessments is during the initial build or during a revision of the assessment documents. Through various forums, CNA continues to engage leaders in this initiative. Additionally, work is underway at Infoway Standards Collaborative where C-HOBIC is progressing toward final approval for the designation of Canadian Approved Standard (CAS).

CNA has also undertaken work with faculty in colleges and universities in participating Canadianprovinces to incorporate content into nursing curricula about standardized clinical terminology, standardizedclinical assessment, nursing-sensitive outcomes and"outcomes focused care". This work is ongoing but the goal is to ensure that graduatingnurses enter practicewith this knowledge[14].

Conclusion

The electronic collection of standardized clinical outcomes offers the nursing profession information to support the accountability agenda. Nurses will have information to assess what interventions improve the clinical outcomes of the people to whom they provide care. Furthermore, the aggregate database will provide valuable information to advance nursing's research and policy agenda.

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